

# Achieving a System of Marine Protected Areas in the Northwest Straits Region of Washington State: A Nearshore Perspective

Kate Smukler

NOAA National Marine Protected Areas Center

## Abstract

Marine Protected Areas (MPAs) have increasingly been recognized as a tool to manage and help protect fragile marine ecosystems. Systems or networks of MPAs may provide more effective protection for the diversity of species and their life history stages than single, isolated MPAs. The Northwest Straits Marine Conservation Initiative in Washington State has a mandate to “achieve a scientifically-based, regional system of MPAs.” This will be achieved through local marine resources committees (MRCs) in each of the seven counties along the Northwest Straits organized by the Northwest Straits Commission. The 107 documented MPAs, offering varying degrees of protection, have been established in this region by federal and state agencies, local governments, and private organizations. Most were established independently, and were not intended or designed to function as a network. Using the ShoreZone Inventory developed by the Washington Department of Natural Resources (WDNR), habitat characteristics along the shoreline of each MPA were examined and mapped. The degree to which each regional habitat type was represented in existing MPAs was evaluated within both partially and fully protected MPAs. Representativeness has been identified as a criterion in MPA network design when the goal is to protect biodiversity, and has been utilized in the planning processes. This preliminary analysis of the functionality of a de facto MPA network is an example of a tool to improve the use of MPA networks in protecting marine biodiversity in the Northwest Straits region of Washington State, and may serve as a national model for MPA network development.

## Extended Abstract

Marine Protected Areas (MPAs) have increasingly been recognized as a tool to manage and help protect fragile marine ecosystems. As defined by Presidential Executive Order 13158, an MPA is:

*Any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein (2000).*

Systems or networks of MPAs may provide more effective protection for the diversity of species and their life history stages than single, isolated MPAs.

The Northwest Straits Marine Conservation Initiative, established by Congress in 1999, has a mandate to “Achieve a Scientifically-Based, Regional System of Marine Protected Areas in the Northwest Straits.” This is to be achieved through local marine resources committees (MRCs) in each of the seven counties along the Northwest Straits through the Northwest Straits Commission, a regional organization. Located in the northwest corner of Washington State, these estuarine waters experience large tidal fluctuations and significant freshwater inputs. To date, 107 MPAs have been established in this region by federal and state agencies, local governments, and private organizations. These MPAs offer varying levels of protection. Most were established independently, and were not intended or designed to function as a network.

Using the ShoreZone Inventory developed by the Washington Department of Natural Resources (WDNR), habitat characteristics along the shoreline of each MPA were mapped using Geographic Information Systems (GIS). **The ShoreZone Inventory examines shoreline habitats throughout the entire state, which provides a comprehensive view of the region, but the data is limited to the nearshore. Therefore, this analysis is limited to the nearshore marine environment.**

After investigating the habitat types within the existing MPAs along the Northwest Straits, these MPAs were evaluated together for functionality as a “de facto” MPA network based on five criteria of MPA network design from primary literature. These criteria include representativeness, replication, oceanographic linkage, size, and level of protection. For **representativeness**, the proportions of each habitat type within MPAs should be equal to the proportions of each habitat type that exists regionally. For example, if 49% of the Northwest Straits shoreline is sand/gravel then 49% of the shorelines within existing MPAs should be sand/gravel to be representative of the region. **Replication** refers to protecting multiple areas of similar habitat to guard against natural or human disturbance, offset the chance of poor site selection,

and help facilitate scientific research and monitoring. Potential **oceanographic linkages** between sites would allow species at different life history stages to utilize multiple MPAs, thereby providing greater protection. **Size and level of protection** can also affect the success of the network if MPAs are not large enough or provide enough protection to the species within.

Approximately 19% of the shoreline within the Northwest Straits is contained within these documented 107 MPAs. However, most of these confer only partial protection to the species within them, so sites were divided into “fully protected” and “partially protected”. Within the Northwest Straits, 3% of the shoreline lies within fully protected MPAs, while partially protected MPAs represent 16% of the entire Northwest Straits shoreline.

Based on MPA network design criteria, fully protected MPAs exhibit a minimal degree of representativeness along the shoreline. Although some habitat types have significant protection, the majority of habitat types are under represented in fully protected MPA shorelines of the Northwest Straits. Replication is insufficient for fully protected MPA shorelines, except within San Juan County. Therefore, the potential for oceanographic linkage between fully protected MPAs is small within the Northwest Straits. In addition, because the size of these fully protected MPAs is very small, relatively few individual organisms may be protected by these MPAs.

Within partially protected MPAs, most of the species within these shorelines are not protected by existing regulations. Representatives of most habitat types are protected, although some are still under represented. Replication is limited in certain parts of the region, so potential oceanographic linkages could exist for species whose harvest is restricted.

Enhancing or expanding protection within existing MPAs could achieve substantially greater protection for marine and estuarine species. New MPAs could also be established to help guard against natural and human disturbances and provide connected refugia for species at all life history stages. Additional research on subtidal habitats, larval dispersal, and effectiveness of existing MPAs could provide more information on MPA network design in the region. Increased coordination between management authorities on site establishment, monitoring, and effectiveness would also improve the “*de facto*” network as a whole. As the Northwest Straits Marine Conservation Initiative works to protect and restore marine resources on a *regional* scale, an ecosystem-based approach must guide decisions at every level.

MPA networks represent an emerging tool for reversing the decline of marine resources worldwide. Achieving a network or system of marine protected areas in the Northwest Straits will require greater coordination and research, but will also depend greatly on socioeconomic and political factors. Both *external* (or public) and *internal* (within agencies and organizations) education about how MPAs can be more effectively used as a conservation tool in the region is essential to achieving the Northwest Straits Marine Conservation Initiative benchmark.

*The full report with figures can be downloaded from the Northwest Straits Commission website, <http://www.nwstraits.org>*